SEQUENCE LISTING

<110> Soe, J[illegible]
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Madrid, Susan
Zargahi, Masoud

<120> Improved Method for Preparing Flour Doughs and Products Made From Such Doughs Using a Glycerol Oxidase

<130> 674509-2045.1

<140> US 10/040,394
<141> 2002-01-09

<150> US 09/402,664
<151> 1998-04-03

<150> PCT/DK98/00136
<151> 1998-04-03

<150> DK 0400/97
<151> 1997-04-09

<160> 22

<170> PatentIn version 3.1

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<213> Aspergillus tubingensis

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<221> MISC_FEATURE
<222> (22)..(22)
<223> "Xaa" can be any amino acid

<400> 1

Ser Val Ser Thr Ser Thr Leu Asp Glu Leu Gln Leu Phe Ala Gln Trp
1 5 10 15

Ser Ala Ala Ala Tyr Xaa Ser Asn Asn
20 25

<210> 2
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<213> Aspergillus tubingensis

<400> 2

Val His Thr Gly Phe Trp Lys
1 5

<210> 3
<211> 14
<212> PRT
<213> Aspergillus tubingensis

<400> 3

Ala Trp Glu Ser Ala Ala Asp Glu Leu Thr Ser Lys Ile Lys
1 5 10

<210> 4
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer used for PCR amplification of a fragment of the lipase gene

<220>
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<222> (9)..(9)
<223> "n" can be a or t/u or g or c

<220>
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<222> (12)..(12)
<223> "n" can be a or t/u or g or c

<220>
<221> misc_feature
<222> (18)..(18)
<223> "n" can be a or t/u or g or c

<400> 4
ttccaraanc cngtrtgnac 20

<210> 5
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer used for PCR amplification of a fragment of the lipase gene

<220>
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<222> (6)..(6)
<223> "n" can be a or t/u or g or c

<220>
<221> misc_feature
<222> (12)..(12)
<223> "n" can be a or t/u or g or c

<400> 5
carytnttyg cncartgg 18

<210> 6
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer used for PCR amplification of a fragment of the lipase gene

<400> 6
gcvgchswyt cccavgc 17

<210> 7
<211> 317
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cagttgttcg cgcaatggtc tgccgcagct tattgctcga ataatatcga ctcgaaagav 60

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ctgctggagt tcgacctgta tgtcactcag atcgcagaca tagagcacag ctaattgaac 180

aggacgaacg acttttggag gcacagccgg tttcctggcc gcggacaaca ccaacaagcg 240

gctcgtggtc gccttccggg gaagcagcac gattgagaac tggattgcta atcytgactt 300

catcctggra gataacg 317

<210> 8
<211> 1045
<212> DNA
<213> Aspergillus tubingensis

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ccggcaccgc ttgctgtgcg gagtaggtgt gcccgatgtg agatggttgg atagcactga 120

tgaagggtga ataggtgtct cgacttccac gttggatgag ttgcaattgt tcgcgcaatg 180

gtctgccgca gcttattgct cgaataatat cgactcgaaa gactccaact tgacatgcac 240

ggccaacgcc tgtccatcag tcgaggaggc cagtaccacg atgctgctgg agttcgacct 300

gtatgtcact cagatcgcag acatagagca cagctaattt gaacaggacg aacgactttg 360

gaggcacagc cggtttcctg gccgcggaca acaccaacaa gcggctcgtg gtcgccttcc 420

ggggaagcag cacgattgag aactggattg ctaatcttga cttcatcctg gaagataacg 480

acgacctctg caccggctgc aaggtccata ctggtttctg gaaggcatgg gagtccgctg 540

ccgacgaact gacgagcaag atcaagtctg cgatgagcac gtattcgggc tataccctat 600

acttcaccgg gcacagtttg ggcggcgcat tggctacgct gggagcgaca gttctgcgaa 660

atgacggata tagcgttgag ctggtgagtc cttcacaaag gtgatggagc gacaatcggg 720

aacagacagt caatagtaca cctatggatg tcctcgaatc ggaaactatg cgctggctga 780

gcatatcacc agtcagggat ctggggccaa cttccgtgtt acacacttga acgacatcgt 840

cccccgggtg ccacccatgg actttggatt cagtcagcca agtccggaat actggatcac 900

cagtggcaat ggagccagtg tcacggcgtc ggatatcgaa gtcatcgagg gaatcaattc 960

aacggcggga aatgcaggcg aagcaacggt gagcgttgtg gctcacttgt ggtacttttt 1020

tgcgatttcc gagtgcctgc tataa 1045

<210> 9
<211> 297
<212> PRT
<213> Aspergillus tubingensis

<400> 9

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Gly Ala Ala Ala Pro Ala Pro Leu Ala Val Arg Ser Val Ser Thr Ser
20 25 30

Thr Leu Asp Glu Leu Gln Leu Phe Ala Gln Trp Ser Ala Ala Ala Tyr
35 40 45

Cys Ser Asn Asn Ile Asp Ser Lys Asp Ser Asn Leu Thr Cys Thr Ala
50 55 60

Asn Ala Cys Pro Ser Val Glu Glu Ala Ser Thr Thr Met Leu Leu Glu
65 70 75 80

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Phe Asp Leu Thr Asn Asp Phe Gly Gly Thr Ala Gly Phe Leu Ala Ala
                85                  90                  95

Asp Asn Thr Asn Lys Arg Leu Val Val Ala Phe Arg Gly Ser Ser Thr
            100                 105                 110

Ile Glu Asn Trp Ile Ala Asn Leu Asp Phe Ile Leu Glu Asp Asn Asp
        115                 120                 125

Asp Leu Cys Thr Gly Cys Lys Val His Thr Gly Phe Trp Lys Ala Trp
    130                 135                 140

Glu Ser Ala Ala Asp Glu Leu Thr Ser Lys Ile Lys Ser Ala Met Ser
145                 150                 155                 160

Thr Tyr Ser Gly Tyr Thr Leu Tyr Phe Thr Gly His Ser Leu Gly Gly
                165                 170                 175

Ala Leu Ala Thr Leu Gly Ala Thr Val Leu Arg Asn Asp Gly Tyr Ser
            180                 185                 190

Val Glu Leu Tyr Thr Tyr Gly Cys Pro Arg Ile Gly Asn Tyr Ala Leu
        195                 200                 205

Ala Glu His Ile Thr Ser Gln Gly Ser Gly Ala Asn Phe Arg Val Thr
    210                 215                 220

His Leu Asn Asp Ile Val Pro Arg Val Pro Pro Met Asp Phe Gly Phe
225                 230                 235                 240

Ser Gln Pro Ser Pro Glu Tyr Trp Ile Thr Ser Gly Asn Gly Ala Ser
                245                 250                 255

Val Thr Ala Ser Asp Ile Glu Val Ile Glu Gly Ile Asn Ser Thr Ala
            260                 265                 270

Gly Asn Ala Gly Glu Ala Thr Val Ser Val Val Ala His Leu Trp Tyr
        275                 280                 285

Phe Phe Ala Ile Ser Glu Cys Leu Leu
    290                 295
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<210> 10
<211> 392
<212> PRT
<213> Rhizopus delamar

<400> 10

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Met Val Ser Phe Ile Ser Ile Ser Gln Gly Val Ser Leu Cys Leu Leu
1               5                  10                  15

Val Ser Ser Met Met Leu Gly Ser Ser Ala Val Pro Val Ser Gly Lys
            20                  25                  30

Ser Gly Ser Ser Asn Thr Ala Val Ser Ala Ser Asp Asn Ala Ala Leu
        35                  40                  45

Pro Pro Leu Ile Ser Ser Arg Cys Ala Pro Pro Ser Asn Lys Gly Ser
    50                  55                  60

Lys Ser Asp Leu Gln Ala Glu Pro Tyr Asn Met Gln Lys Asn Thr Glu
65                  70                  75                  80

Trp Tyr Glu Ser His Gly Gly Asn Leu Thr Ser Ile Gly Lys Arg Asp
                85                  90                  95

Asp Asn Leu Val Gly Gly Met Thr Leu Asp Leu Pro Ser Asp Ala Pro
            100                 105                 110

Pro Ile Ser Leu Ser Ser Ser Thr Asn Ser Ala Ser Asp Gly Gly Lys
        115                 120                 125

Val Val Ala Ala Thr Thr Ala Gln Ile Gln Glu Phe Thr Lys Tyr Ala
    130                 135                 140

Gly Ile Ala Ala Thr Ala Tyr Cys Arg Ser Val Val Pro Gly Asn Lys
145                 150                 155                 160

Trp Asp Cys Val Gln Cys Gln Lys Trp Val Pro Asp Gly Lys Ile Ile
                165                 170                 175

Thr Thr Phe Thr Ser Leu Leu Ser Asp Thr Asn Gly Tyr Val Leu Arg
            180                 185                 190

Ser Asp Lys Gln Lys Thr Ile Tyr Leu Val Phe Arg Gly Thr Asn Ser
```

```
        195                 200                 205

Phe Arg Ser Ala Ile Thr Asp Ile Val Phe Asn Phe Ser Asp Tyr Lys
    210                 215                 220

Pro Val Lys Gly Ala Lys Val His Ala Gly Phe Leu Ser Ser Tyr Glu
225                 230                 235                 240

Gln Val Val Asn Asp Tyr Phe Pro Val Val Gln Glu Gln Leu Thr Ala
                245                 250                 255

His Pro Thr Tyr Lys Val Ile Val Thr Gly His Ser Leu Gly Gly Ala
            260                 265                 270

Gln Ala Leu Leu Ala Gly Met Asp Leu Tyr Gln Arg Glu Pro Arg Leu
        275                 280                 285

Ser Pro Lys Asn Leu Ser Ile Phe Thr Val Gly Gly Pro Arg Val Gly
    290                 295                 300

Asn Pro Thr Phe Ala Tyr Tyr Val Glu Ser Thr Gly Ile Pro Phe Gln
305                 310                 315                 320

Arg Thr Val His Lys Arg Asp Ile Val Pro His Val Pro Pro Gln Ser
                325                 330                 335

Phe Gly Phe Leu His Pro Gly Val Glu Ser Trp Ile Lys Ser Gly Thr
            340                 345                 350

Ser Asn Val Gln Ile Cys Thr Ser Glu Ile Glu Thr Lys Asp Cys Ser
        355                 360                 365

Asn Ser Ile Val Pro Phe Thr Ser Ile Leu Asp His Leu Ser Tyr Phe
    370                 375                 380

Asp Ile Asn Glu Gly Ser Cys Leu
385                 390
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<210> 11
<211> 363
<212> PRT
<213> Rhizomucor miehei

<400> 11

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Met Val Leu Lys Gln Arg Ala Asn Tyr Leu Gly Phe Leu Ile Val Phe
1               5                  10                  15

Phe Thr Ala Phe Leu Val Glu Ala Val Pro Ile Lys Arg Gln Ser Asn
            20                  25                  30

Ser Thr Val Asp Ser Leu Pro Pro Leu Ile Pro Ser Arg Thr Ser Ala
        35                  40                  45

Pro Ser Ser Ser Pro Ser Thr Thr Asp Pro Glu Ala Pro Ala Met Ser
    50                  55                  60

Arg Asn Gly Pro Leu Pro Ser Asp Val Glu Thr Lys Tyr Gly Met Ala
65                  70                  75                  80

Leu Asn Ala Thr Ser Tyr Pro Asp Ser Val Val Gln Ala Met Ser Ile
                85                  90                  95

Asp Gly Gly Ile Arg Ala Ala Thr Ser Gln Glu Ile Asn Glu Leu Thr
            100                 105                 110

Tyr Tyr Thr Thr Leu Ser Ala Asn Ser Tyr Cys Arg Thr Val Ile Pro
        115                 120                 125

Gly Ala Thr Trp Asp Cys Ile His Cys Asp Ala Thr Glu Asp Leu Lys
    130                 135                 140

Ile Ile Lys Thr Trp Ser Thr Leu Ile Tyr Asp Thr Asn Ala Met Val
145                 150                 155                 160

Ala Arg Gly Asp Ser Glu Lys Thr Ile Tyr Ile Val Phe Arg Gly Ser
                165                 170                 175

Ser Ser Ile Arg Asn Trp Ile Ala Asp Leu Thr Phe Val Pro Val Ser
            180                 185                 190

Tyr Pro Pro Val Ser Gly Thr Lys Val His Lys Gly Phe Leu Asp Ser
        195                 200                 205

Tyr Gly Glu Val Gln Asn Glu Leu Val Ala Thr Val Leu Asp Gln Phe
    210                 215                 220
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```
Lys Gln Tyr Pro Ser Tyr Lys Val Ala Val Thr Gly His Ser Leu Gly
225                 230                 235                 240

Gly Ala Thr Ala Leu Leu Cys Ala Leu Asp Leu Tyr Gln Arg Glu Glu
                245                 250                 255

Gly Leu Ser Ser Ser Asn Leu Phe Leu Tyr Thr Gln Gly Gln Pro Arg
            260                 265                 270

Val Gly Asp Pro Ala Phe Ala Asn Tyr Val Val Ser Thr Gly Ile Pro
        275                 280                 285

Tyr Arg Arg Thr Val Asn Glu Arg Asp Ile Val Pro His Leu Pro Pro
    290                 295                 300

Ala Ala Phe Gly Phe Leu His Ala Gly Glu Glu Tyr Trp Ile Thr Asp
305                 310                 315                 320

Asn Ser Pro Glu Thr Val Gln Val Cys Thr Ser Asp Leu Glu Thr Ser
                325                 330                 335

Asp Cys Ser Asn Ser Ile Val Pro Phe Thr Ser Val Leu Asp His Leu
            340                 345                 350

Ser Tyr Phe Gly Ile Asn Thr Gly Leu Cys Thr
        355                 360
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<210> 12
<211> 305
<212> PRT
<213> Penicillium camemberti

<400> 12

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Met Arg Leu Ser Phe Phe Thr Ala Leu Ser Ala Val Ala Ser Leu Gly
1               5                   10                  15

Tyr Ala Leu Pro Gly Lys Leu Gln Ser Arg Asp Val Ser Thr Ser Glu
            20                  25                  30

Leu Asp Gln Phe Glu Phe Trp Val Gln Tyr Ala Ala Ala Ser Tyr Tyr
        35                  40                  45

Glu Ala Asp Tyr Thr Ala Gln Val Gly Asp Lys Leu Ser Cys Ser Lys
    50                  55                  60
```

```
Gly Asn Cys Pro Glu Val Glu Ala Thr Gly Ala Thr Val Ser Tyr Asp
65                  70                  75                  80

Phe Ser Asp Ser Thr Ile Thr Asp Thr Ala Gly Tyr Ile Ala Val Asp
                85                  90                  95

His Thr Asn Ser Ala Val Val Leu Ala Phe Arg Gly Ser Tyr Ser Val
            100                 105                 110

Arg Asn Trp Val Ala Asp Ala Thr Phe Val His Thr Asn Pro Gly Leu
        115                 120                 125

Cys Asp Gly Cys Leu Ala Glu Leu Gly Phe Trp Ser Ser Trp Lys Leu
    130                 135                 140

Val Arg Asp Asp Ile Ile Lys Glu Leu Lys Glu Val Val Ala Gln Asn
145                 150                 155                 160

Pro Asn Tyr Glu Leu Val Val Val Gly His Ser Leu Gly Ala Ala Val
                165                 170                 175

Ala Thr Leu Ala Ala Thr Asp Leu Arg Gly Lys Gly Tyr Pro Ser Ala
            180                 185                 190

Lys Leu Tyr Ala Tyr Ala Ser Pro Arg Val Gly Asn Ala Ala Leu Ala
        195                 200                 205

Lys Tyr Ile Thr Ala Gln Gly Asn Asn Phe Arg Phe Thr His Thr Asn
    210                 215                 220

Asp Pro Val Pro Lys Leu Pro Leu Leu Ser Met Gly Tyr Val His Val
225                 230                 235                 240

Ser Pro Glu Tyr Trp Ile Thr Ser Pro Asn Asn Ala Thr Val Ser Thr
                245                 250                 255

Ser Asp Ile Lys Val Ile Asp Gly Asp Val Ser Phe Asp Gly Asn Thr
            260                 265                 270

Gly Thr Gly Leu Pro Leu Leu Thr Asp Phe Glu Ala His Ile Trp Tyr
        275                 280                 285
```

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Phe Val Gln Val Asp Ala Gly Lys Gly Pro Gly Leu Pro Phe Lys Arg
    290                 295                 300

Val
305
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<210> 13
<211> 334
<212> DNA
<213> Aspergillus tubingensis

<220>
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<222> (10)..(10)
<223> "n" can be a or g or c or t/u

<220>
<221> CDS
<222> (18)..(329)
<223>

<400> 13

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tacccggggn tccgatt cag ttg ttc gcg caa tgg tct gcc gca gct tat        50
                  Gln Leu Phe Ala Gln Trp Ser Ala Ala Ala Tyr
                  1               5                   10

tgc tcg aat aat atc gac tcg aaa gav tcc aac ttg aca tgc acg gcc        98
Cys Ser Asn Asn Ile Asp Ser Lys Xaa Ser Asn Leu Thr Cys Thr Ala
            15                  20                  25

aac gcc tgt cca tca gtc gag gag gcc agt acc acg atg ctg ctg gag       146
Asn Ala Cys Pro Ser Val Glu Glu Ala Ser Thr Thr Met Leu Leu Glu
        30                  35                  40

ttc gac ctg tat gtc act cag atc gca gac ata gag cac agc taa ttg       194
Phe Asp Leu Tyr Val Thr Gln Ile Ala Asp Ile Glu His Ser     Leu
    45                  50                  55

aac agg acg aac gac ttt tgg agg cac agc cgg ttt cct ggc cgc gga       242
Asn Arg Thr Asn Asp Phe Trp Arg His Ser Arg Phe Pro Gly Arg Gly
    60                  65                  70

caa cac caa caa gcg gct cgt ggt cgc ctt ccg ggg aag cag cac gat       290
Gln His Gln Gln Ala Ala Arg Gly Arg Leu Pro Gly Lys Gln His Asp
75                  80                  85                  90

tga gaa ctg gat tgc taa tcy tga ctt cat cct ggr aga taacg             334
    Glu Leu Asp Cys     Xaa     Leu His Pro Xaa Arg
                        95                  100
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<210> 14

<211> 57
<212> PRT
<213> Aspergillus tubingensis

<220>
<221> misc_feature
<222> (20)..(20)
<223> The 'Xaa' at location 20 stands for Glu, or Asp.

<220>
<221> misc_feature
<222> (10)..(10)
<223> "n" can be a or g or c or t/u

<400> 14

Gln Leu Phe Ala Gln Trp Ser Ala Ala Ala Tyr Cys Ser Asn Asn Ile
1 5 10 15

Asp Ser Lys Xaa Ser Asn Leu Thr Cys Thr Ala Asn Ala Cys Pro Ser
20 25 30

Val Glu Glu Ala Ser Thr Thr Met Leu Leu Glu Phe Asp Leu Tyr Val
35 40 45

Thr Gln Ile Ala Asp Ile Glu His Ser
50 55

<210> 15
<211> 33
<212> PRT
<213> Aspergillus tubingensis

<220>
<221> misc_feature
<222> (10)..(10)
<223> "n" can be a or g or c or t/u

<400> 15

Leu Asn Arg Thr Asn Asp Phe Trp Arg His Ser Arg Phe Pro Gly Arg
1 5 10 15

Gly Gln His Gln Gln Ala Ala Arg Gly Arg Leu Pro Gly Lys Gln His
20 25 30

Asp

<210> 16

<211> 4
<212> PRT
<213> Aspergillus tubingensis

<220>
<221> misc_feature
<222> (10)..(10)
<223> "n" can be a or g or c or t/u

<400> 16

Glu Leu Asp Cys
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<210> 17
<211> 5
<212> PRT
<213> Aspergillus tubingensis

<220>
<221> misc_feature
<222> (4)..(4)
<223> The 'Xaa' at location 4 stands for Gly.

<220>
<221> misc_feature
<222> (10)..(10)
<223> "n" can be a or g or c or t/u

<400> 17

Leu His Pro Xaa Arg
1 5

<210> 18
<211> 1833
<212> DNA
<213> Aspergillus tubingensis

<220>
<221> misc_feature
<222> (3)..(3)
<223> n can be a or g or c or t/u

<220>
<221> exon
<222> (372)..(453)
<223>

<220>
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<222> (506)..(672)
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<222> (719)..(1054)
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<220>
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<222> (1108)..(1413)
<223>

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ccccagttgc gcaacggaac aaccgccgac ccggaacaaa ggatgcggat gaggagatac 120

ggtgcctgat tgcatggctg gcttcatctg ctatcgtgac agtgctcttt gggtgaatat 180

tgttgtctga cttaccccgc ttcttgcttt ttccccccctg aggccctgat ggggaatcgc 240

ggtgggtaat atgatatggg tataaaaggg agatcggagg tgcagttgga ttgaggcagt 300

gtgtgtgtgt gcattgcaga agcccgttgg tcgcaaggtt ttggtcgcct cgattgtttg 360

tataccgcaa g atg ttc tct gga cgg ttt gga gtg ctt ttg aca gcg ctt 410
Met Phe Ser Gly Arg Phe Gly Val Leu Leu Thr Ala Leu
1 5 10

gct gcg ctg ggt gct gcc gcg ccg gca ccg ctt gct gtg cgg a 453
Ala Ala Leu Gly Ala Ala Ala Pro Ala Pro Leu Ala Val Arg
15 20 25

gtaggtgtgc ccgatgtgag atggttggat agcactgatg aagggtgaat ag gt gtc 510
Ser Val

tcg act tcc acg ttg gat gag ttg caa ttg ttc gcg caa tgg tct gcc 558
Ser Thr Ser Thr Leu Asp Glu Leu Gln Leu Phe Ala Gln Trp Ser Ala
30 35 40 45

gca gct tat tgc tcg aat aat atc gac tcg aaa gac tcc aac ttg aca 606
Ala Ala Tyr Cys Ser Asn Asn Ile Asp Ser Lys Asp Ser Asn Leu Thr
50 55 60

tgc acg gcc aac gcc tgt cca tca gtc gag gag gcc agt acc acg atg 654
Cys Thr Ala Asn Ala Cys Pro Ser Val Glu Glu Ala Ser Thr Thr Met
65 70 75

ctg ctg gag ttc gac ctg tatgtcactc agatcgcaga catagagcac 702
Leu Leu Glu Phe Asp Leu
80

agctaatttg aacagg acg aac gac ttt gga ggc aca gcc ggt ttc ctg gcc 754
Thr Asn Asp Phe Gly Gly Thr Ala Gly Phe Leu Ala

```
                        85                  90                  95

gcg gac aac acc aac aag cgg ctc gtg gtc gcc ttc cgg gga agc agc      802
Ala Asp Asn Thr Asn Lys Arg Leu Val Val Ala Phe Arg Gly Ser Ser
                100                 105                 110

acg att gag aac tgg att gct aat ctt gac ttc atc ctg gaa gat aac      850
Thr Ile Glu Asn Trp Ile Ala Asn Leu Asp Phe Ile Leu Glu Asp Asn
            115                 120                 125

gac gac ctc tgc acc ggc tgc aag gtc cat act ggt ttc tgg aag gca      898
Asp Asp Leu Cys Thr Gly Cys Lys Val His Thr Gly Phe Trp Lys Ala
        130                 135                 140

tgg gag tcc gct gcc gac gaa ctg acg agc aag atc aag tct gcg atg      946
Trp Glu Ser Ala Ala Asp Glu Leu Thr Ser Lys Ile Lys Ser Ala Met
    145                 150                 155

agc acg tat tcg ggc tat acc cta tac ttc acc ggg cac agt ttg ggc      994
Ser Thr Tyr Ser Gly Tyr Thr Leu Tyr Phe Thr Gly His Ser Leu Gly
160                 165                 170                 175

ggc gca ttg gct acg ctg gga gcg aca gtt ctg cga aat gac gga tat     1042
Gly Ala Leu Ala Thr Leu Gly Ala Thr Val Leu Arg Asn Asp Gly Tyr
                180                 185                 190

agc gtt gag ctg gtgagtcctt cacaaaggtg atggagcgac aatcgggaac         1094
Ser Val Glu Leu
            195

agacagtcaa tag tac acc tat gga tgt cct cga atc gga aac tat gcg      1143
               Tyr Thr Tyr Gly Cys Pro Arg Ile Gly Asn Tyr Ala
                            200                 205

ctg gct gag cat atc acc agt cag gga tct ggg gcc aac ttc cgt gtt     1191
Leu Ala Glu His Ile Thr Ser Gln Gly Ser Gly Ala Asn Phe Arg Val
        210                 215                 220

aca cac ttg aac gac atc gtc ccc cgg gtg cca ccc atg gac ttt gga     1239
Thr His Leu Asn Asp Ile Val Pro Arg Val Pro Pro Met Asp Phe Gly
    225                 230                 235

ttc agt cag cca agt ccg gaa tac tgg atc acc agt ggc aat gga gcc     1287
Phe Ser Gln Pro Ser Pro Glu Tyr Trp Ile Thr Ser Gly Asn Gly Ala
240                 245                 250                 255

agt gtc acg gcg tcg gat atc gaa gtc atc gag gga atc aat tca acg     1335
Ser Val Thr Ala Ser Asp Ile Glu Val Ile Glu Gly Ile Asn Ser Thr
                260                 265                 270

gcg gga aat gca ggc gaa gca acg gtg agc gtt gtg gct cac ttg tgg     1383
Ala Gly Asn Ala Gly Glu Ala Thr Val Ser Val Val Ala His Leu Trp
            275                 280                 285

tac ttt ttt gcg att tcc gag tgc ctg cta taactagacc gactgtcaga      1433
Tyr Phe Phe Ala Ile Ser Glu Cys Leu Leu
        290                 295
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ttagtggacg ggagaagtgt acataagtaa ttagtatata atcagagcaa cccagtggtg 1493

gtgatggtgg tgaaagaaga aacacattga gttcccatta cgkagcagwt aaagcacktk 1553

kggaggcgct ggttcctcca cttggcagtt ggcggccatc aatcatcttt cctctcctta 1613

ctttcgtcca ccacaactcc catcctgcca gctgtcgcat ccccgggttg caacaactat 1673

cgcctccggg gcctccgtgg ttctcctata ttattccatc cgacggccga cgtttcaccc 1733

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atcgacctca cgaccccgac cgtctgygat ygtccaaccg 1833

<210> 19
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> selected lipase 3 peptide

<400> 19

Ala Trp Glu Ser Ala Ala Asp Glu Leu Thr Ser Lys Ile Lys
1 5 10

<210> 20
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> N terminal lipase 3 peptide

<220>
<221> MISC_FEATURE
<222> (22)..(22)
<223> "x" can be any amino acid

<400> 20

Ser Val Ser Thr Ser Thr Leu Asp Glu Leu Gln Leu Phe Ala Gln Trp
1 5 10 15

Ser Ala Ala Ala Tyr Xaa Ser Asn Asn
20 25

<210> 21
<211> 6
<212> PRT

<213> Artificial Sequence

<220>
<223> portion of N-terminal lipase peptide used in synthesizing PCR primer C036

<400> 21

Gln Leu Phe Ala Gln Trp
1 5

<210> 22
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> portion of N-terminal lipase peptide used in synthesizing PCR primer C037

<400> 22

Ala Trp Glu Ser Ala Ala
1 5